SAFETY CAR DETECTION WITH NOTIFICATION SYSTEM

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Bachelor of Computer Science (Software Engineering) with Honours

UNIVERSITI MALAYSIA PAHANG

SUPERVISOR's DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Computer Science (Software Engineering)

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citation which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Pengesanan Kereta Keselamatan dengan Sistem Pemberitahuan adalah aplikasi mudah alih yang digabungkan dengan Arduino. Projek ini dibina dengan Mikrokontroller Arduino Uno, sensor suhu, sensor kemalangan, sensor asap, modul GPS, modul GSM, modul Bluetooth dan papan roti. Pengesanan Kereta Keselamatan ini dengan Sistem Pemberitahuan akan bermula, apabila aplikasi ini dipasang dalam peranti android dan Bluetooth dihubungkan antara android dan sensor Arduino. Seterusnya, kerana terdapat tiga sensor yang digunakan dalam projek ini, pemberitahuan akan dihantar apabila mereka mengesan mana-mana tiga sensor ini, haba (apabila suhu kereta melebihi 78 ℃), kemalangan (ketika kereta mengalami kemalangan) dan asap (apabila jumlah intensiti asap di dalam kereta melebihi had yang dinyatakan). Kemudian, pemberitahuan akan dihantar kepada nombor yang telah diberikan, iaitu ibu bapa, ambulans dan Jabatan Bomba and Penyelamat Malaysia. Pemberitahuan ini akan mengandungi maklumat mengenai sensor jenis apa yang dikesan dan koordinasi lokasi kemalangan dengan pautan peta Google. Pengesanan Kereta Keselamatan dengan Sistem Pemberitahuan yang dibangunkan sejak bilangan orang meninggal dunia di lokasi kemalangan akibat maklumat terlambat yang diterima di keluarga mangsa kemalangan, ambulans dan Jabatan Bomba dan Penyelamat Malaysia. Tambahan pula, kebanyakan kes kemalangan berlaku di kawasan luar bandar dan laluan yang mempunyai sedikit orang diluluskan. Selain itu, Pengesanan Kereta Keselamatan dengan Sistem Pemberitahuan yang dibangunkan untuk memastikan tindakan menyelamat akan diterima dalam masa yang singkat, kerana permohonan ini akan membantu menyampaikan maklumat sebaik sahaja kemalangan itu berlaku kepada keluarga mangsa, ambulans dan Jabatan Bomba and Penyelamat Malaysia.

ABSTRACT

Safety Car Detection with Notification System is a mobile application combined with Arduino. This project built with Arduino Uno Microcontroller, temperature sensor, crash sensor, gas sensor, GPS module, GSM module, Bluetooth module and breadboard. This Safety Car Detection with Notification System will initiate, when this application installed in an android device and the Bluetooth is connected between the android and the Arduino sensors. Next, since there are three sensors used in this project, the notification will be send when they detect any of these three sensors, heat (when temperature of the car is exceeding 78°C), crash (when the car experienced crash) and gas(when the intensity volume of gas in the car exceed the limit stated). Then, a notification will be deliver to the number has been assigned, i.e. parent, ambulance and Malaysia Fire and Rescue Department. The notification will contain the information of what kind sensor detected and the coordination of accident location with the Google maps link. Safety Car Detection with Notification System developed since the number of people died at the location of accident due to the late information received at the family of accident victims, ambulance and Malaysia Fire and Rescue Department. Plus, most of the accident case occurred at rural area and route that has small number of people passed by. Plus, the Safety Car Detection with Notification System developed in order to ensure the rescue action will received in short of time, since this application will help to deliver information as soon as the accident occurred to the family of victims, ambulance and Malaysia Fire and Rescue Department.

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LIST OF ABBREVIATION

ABBREVIATIONS	TITLE
5V	5 Volt
CASE	Computer-Aided Software Engineering
DFD	Data Flow Diagram
GND	Ground
GPRS	General packet Radio Services
GPS	Global Positioning System
GSM	Global System for Mobile Communication
LED	Light Emitting Diode
MEMS	Micro Electro Mechanical Systems
MIT	Massachusetts Institute of Technology
OS	Operating System
RAD	Rapid Application Development
RFID	Radio Frequency Identification
RX	Pin 0 on Arduino Uno Microcontroller
SDD	Software Design Document
SIM	Subscriber Identity Module
SMS	Short Message Service
SRS	Software Requirement Specification
TX	Pin 1 on Arduino Uno Microcontroller
UMP	Universiti Malaysia Pahang
VCC	Voltage Common Collector

CHAPTER 1

INTRODUCTION

1.1 Introduction

Malaysia has been ranked in top 20 country that has highest rate of death caused by accidents. The statistic of the death caused by car issues in Malaysia increased to 70% regarding to (Muhammad, 2015). The statistic of accident in Malaysia keep increasing from year to year. There are several cause that can lead to car accidents, they are poor of car maintenance, dangerous driving behaviour and natural disasters.

Most of car accident occurs at the rural and isolated places will have difficulties to get a quick bailout. Sometimes, victim's life of the accident can be saved but they cannot be saved due to the late information delivered to the person in charge. Plus, there are accidents that can be prevent it from happens, for example car explosions. Car explosions occurs due to the very high temperature of the car engines. If there are alert told that the car engine was on high temperature, the driver can take fast action to cooling down the engines, so the car explosion will not occurs.

Existing system that helps to reduce the number of death regarding car issues already invented. It is a system that can detect collision, fire and gas. This system also functioned to send information regarding these detection to a mobile phone number when they detect these sensors. However, the system invented cannot send the notification to multiple phone number at once. Thus, the issue to reduce the number of death still cannot be solve. Moreover, the system still not stable and efficient as they only can inform one type of detection although there are 3 detection occurs at once.

1.2 Problem Statement

The existing system invented can send the information regarding the accident, but only one mobile phone number at once. Supposedly, the system should send the information to multiple number at once. When only one mobile phone number received the information, it might be that the information was not delivered to the person due to the battery drained or the person was not in feasible condition.

Next, the system also cannot update or reset the designated mobile phone number to the new one. Assume that, nobody will use the same car until the end of their life. Most of people will change their car due to increasing number of family members or to make usability of the car more flexible. Thus, the system should update the mobile phone number to the new one since the owner of the car has changed.

Moreover, the three sensors which collision, heat and gas cannot functioned simultaneously. Mostly, an accident can have a collision and gas, gas and temperature, collision and temperature, and three of them at once. Thus, to make sure that the system will inform all the sensors detected not only one sensor was detected.

1.3 Goals and Objectives

The goal for this project is to develop a system that can help people to take fast actions when someone or their relatives involved in an accident. In order to achieve this goal, the following objectives must be followed:

i. To propose system for car safety detection that can detect three sensors, gas, temperature and crash

ii. To design and develop a prototype that contains variety sensors to transmit the information regarding the accident to the designated person.

iii. To verify that the system can send notification automatically and can update the phone number to the prototype using mobile application.

1.4 Scopes

Scope itself define the extent of the area or subject matter that something deals with or to which it is relevant. For this Car Safety Detection with Notification System there are a few scopes has been highlighted for this project.

i. The scope of this project is focusing on the three sensors which are heat detection, gas detection and collision detection, also to notify the designated person the location that occurred accident.
ii. The scope of this project is for users in car environment only.
iii. The scope of this project focusing for android environment.
iv. The scope for this project focusing for the car outside the building.

1.5 Thesis Organization

Briefly, this thesis consists of five chapters. Each chapter are different to each of them. The list of the chapters are:

i. Chapter 1: Introduction.

ii. Chapter 2: Literature Review.

iii. Chapter 3: Methodology.

iv. Chapter 4: Implementation, Testing, Result and Discussion.

v. Chapter 5: Conclusion.

Chapter 1 explaining on the main cause of this project invented. Starting from the problem statement, objectives and scopes.

Chapter 2, Literature Review where all the comparisons between the existing projects with proposed projects been made. This is to ensure the proposed project choose and implement the most appropriate method.

Chapter 3, Methodology which state which software models will be used along the developments of this project. Plus, there also mentioned the advantages of the software models chosen for this project.

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